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UWindsor Administrator
University of Windsor, scholarship@uwindsor.ca

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FOCUS

On International Joint Commission Activities

IJC Delegation Visits Lake Superior's Shore to Review RAPs

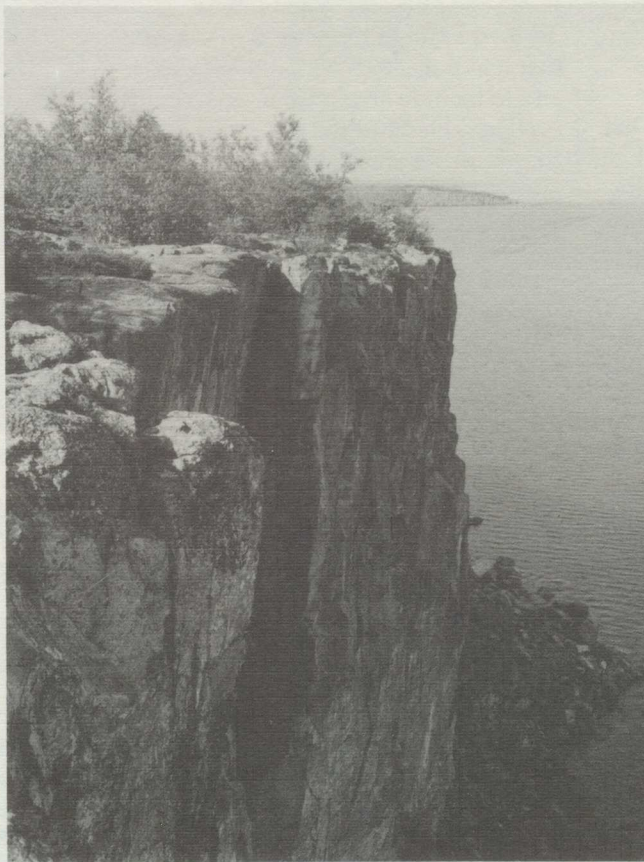
by Frank Bevacqua

In mid-June, Commissioner Hilary Cleveland and Commission staff visited four communities on the north shore of Lake Superior to meet with the local Remedial Action Plan (RAP) teams, Public Advisory Committee (PAC) members, RAP technical reviewers, local news media and others interested in the cleanup plans in the four North Shore Areas of Concern: Jackfish Bay, Nipigon Bay, Peninsula Harbour and Thunder Bay.

It was a long journey for a number of reviewers and Commission representatives, but the extraordinary beauty of the region and the enthusiastic participation at the meetings by the communities' residents made the trip worthwhile. Bringing those involved in the preparation and review of a RAP document together at review meetings helps to clarify the issues before the Commission prepares its formal RAP review comments as required by the Great Lakes Water Quality Agreement.

Fewer Point Sources

The stage one RAP documents reviewed at the meetings attempt to provide a comprehensive description of all degraded water uses and sources of pollution at each Area of Concern. Unlike many other Areas of Concern, those on the north shore are affected by discharges from a limited number of point sources, mainly from pulp and paper mills and municipal waste water treatment plants. Other signifi-



Lake Superior at Palisades Head, Minnesota
Credit: Frank Bevacqua

cant pollution sources include contaminated sediments from past discharges, nonpoint source runoff and atmospheric deposition, though less is known about the last source.

Public Active in Setting Agenda

Since active Public Advisory Committees (PACs) appeared to play an important role in sustaining momentum for the RAP process in all four communities, Commissioner Cleveland asked the PAC members in attendance about their experiences.

The PACs generally held well-attended meetings every four to six weeks and, at times, drew several hundred citizens to open house discussions. Despite frustration with the "bureaucratic pace," PAC members expressed satisfaction in bringing the various community interests to consensus in areas where little dialogue had existed. Another important achievement was incorporating community goals that were not originally part of the RAP process.

Bringing It All Together

Each of the four PACs includes members from the pulp and paper industry, local government, the anglers' associations, as well as other interests.

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Thunder Bay PAC Chair Bob Hartley commented that, over time, the PAC has become a team, with members no longer having separate agendas. PAC member Michael Lynch described the process of working toward consensus when he said, "Virtual elimination (of the discharge of persistent toxic substances) was certainly one area of initial disagreement, so we made a list of things we agreed on and worked on those issues. By the time we got to the other items, it was much easier because of the trust that had been built." The Thunder Bay PAC has become a visible community institution, has submitted consensus positions on various government proposals, and is the forum where contentious local water use issues can be discussed in a nonconfrontational manner.

Nipigon Bay PAC Member Betty Brill recounted how the PAC served as a focal point for community issues

such as the removal of large debris and a wetland restoration project funded by Environment Canada's Great Lakes Cleanup Fund. Even her involvement in shorefront revitalization came into play when it was decided to rebuild the local museum that had burned down on the shore and to include an environmental interpretive center and the history of the community's environment.

Addressing Community Priorities

One major water use that the PACs successfully pushed the RAPs to address was the rehabilitation of native fish populations. For the communities, this goal meant not only improving environmental conditions, but also expanding the potential for tourism and recreation. Local pride was also a factor on the Nipigon River, where the world record brook trout was caught in 1915 (6.6 kg or 14.5 lbs.). The boundary of the Nipigon Bay Area of Concern was extended north to Alexander Dam, the first barrier to migrating fish on the Nipigon River. The PAC also insisted that minimum water levels and streambank stabilization in the Nipigon system be addressed by the RAP. Commissioner Cleveland commented that, "These communities are actively involved in making decisions about their future and the Commission supports the process."

Human health surfaced as a concern during the review meeting at the Jackfish Bay Area of Concern. PAC Chair Jon Ferguson stated that more information about health effects was needed to assess the available data on contaminant loadings. In response, the RAP team agreed to pull the relevant findings together.



Commissioner Hilary Cleveland with Thunder Bay Alderman J.D. Pohill. Opposite page: Participants at the Jackfish Bay RAP review meeting. Inset: Canadian Pacific Forest Products on the Kaministiquia River. Credit: Frank Bevacqua, Lisa Arcand

Long-term Commitment

Finally, the communities have seen dramatic improvements in recent years, including the installation of secondary treatment of effluent at the Kimberly Clark mill at Jackfish Bay and the Canadian Pacific Forest Products facility in Thunder Bay, and planned secondary treatment at the James River Mill at Peninsula Harbour and the sewage treatment plant in Thunder Bay. PAC members felt that, bolstered in part by these improvements, the RAP process could indeed restore local water uses over time. "I am working toward the day when underwater visibility will no longer be an issue," stated diving instructor and Jackfish Bay PAC member Ryan LeBlanc. Brian Honan, member of the Peninsula Harbour RAP, summed it up when he said, "I think the RAP process is going great so long as governments follow through with the necessary resources. We want a clean place to live."



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FOCUS STAFF:

Editor: Sally Cole-Misch
Graphics: Bruce Jamieson

Washington DC Information Officer:
Frank Bevacqua

Ottawa Information Adviser:
Alan Clarke

Regional Office Public Affairs Director:
Sally Cole-Misch

Regional Office Information Officer:
Beverley Croft

Focus is printed three times per year
on recycled paper.

For more information contact:

Focus on IJC Activities
IJC Regional Office
100 Ouellette Avenue, Eighth Floor
Windsor, Ontario, Canada N9A 6T3
or P.O. Box 32869
Detroit, Michigan, U.S.A. 48232
(519)256-7821 or (313)226-2170
FAX (519) 256-7791



Commission's Priority Process Brings Changes to Great Lakes Agreement Boards

Note: As outlined in Volume 16, Issue 2 of Focus, the International Joint Commission created a priority setting process in 1991 to help focus on specific issues over a two-year period and thus more effectively fulfill its responsibilities under the Great Lakes Water Quality Agreement.

As a result, the Commission's two advisory boards -- the Great Lakes Water Quality and Science Advisory Boards -- have revised their structures and programs to reflect this process, as well as the specific issues chosen for the current two-year cycle. The following articles highlight these revisions and the programs initiated by both Boards over the past eight months.

New Commission Priorities for the Great Lakes Water Quality Board

by Michael Gilbertson

The Great Lakes Water Quality Board has embarked on an exciting new agenda, developed in conjunction with the International Joint Commission's priorities

planning process and as a result of the 1987 Protocol to the 1978 Great Lakes Water Quality Agreement. The Protocol transferred many former roles and responsibilities of the Board to the Parties to the Agreement (Canada and the United States), including the coordination of data collection, reporting on loadings and sources of pollutants, and long-term data on contaminants. This work had been undertaken by an elaborate subcommittee structure under the Board since the early 1970s, which included scientists and managers from water quality agencies in both countries. The Protocol reflected the

view that these functions more properly belonged to the Parties, especially since Board members were responsible for the control programs that they also were being asked to evaluate.

As a result, the Commission revised the Board's responsibilities to include development of advice related to policy issues. In April and June 1991, the Board held workshops to develop a vision statement and list of topics it wished to address during the next five years. A brief report on the workshop, "A Policy Vision for the Great Lakes," was distributed at the 1991 Biennial Meeting. The Board also presented its top three preferred priorities to the Commission's Priority Planning Group, and after negotiation these were incorporated into the Commission priorities statement for the 1991-1993 biennial cycle.

The Board's first priority was to advise the Commission on the forthcoming review of the Agreement by the Parties. At a workshop in November 1991, representatives of nongovernmental organizations, academia and industry met with the Board and the co-chairs of the Commission to discuss this topic. At this and subsequent meetings, a consensus

emerged that the revised Agreement -- despite its complexity -- was a workable document and resources should not be allocated to rewrite or renegotiate it. Rather, efforts should be oriented toward implementation of the Agreement. This recommendation was accepted by the Commission and incorporated into its *Sixth Biennial Report on Great Lakes Water Quality*, released this past April.

The Board's second priority area is to review the role of legislative and regulatory mechanisms to virtually eliminate persistent toxic substances. The central policy statement of the revised 1978 Agreement is that "discharges of any and all persistent toxic substances be virtually eliminated." To implement this policy requires not only control of the release of these substances from all sources to all sectors, but also may require prohibition of the manufacture, distribution and use of some substances. The Board held a workshop on this topic in June, and the Board's findings will be included in a report to the Commission in 1993.

Risk assessment is the third topic to be tackled by the Board. Risk assessment methods have increasingly been used to calculate the amount of pollutants that can be safely released to the environment, including the Great Lakes basin. Most methods depend on an estimation of the risk of cancer from the release of particular substances at particular concentrations. Methods are also needed, however, to determine the actual incidence of injury and to estimate reproductive and developmental risks. The Board is planning a workshop on this topic for fall 1992.

For more information about the Board and its work under the 1991-1993 priorities, contact Michael Gilbertson, International Joint Commission, 100 Ouellette Avenue, Eighth floor, Windsor, ON N9A 6T3, telephone (519)256-7821 or P.O. Box 32869, Detroit, MI 48232, telephone (313)226-2170.

Mission, Role and Reorganization of the Great Lakes Science Advisory Board

by Peter Boyer

With the adoption of priorities following public input at the 1991 Biennial Meeting of the International Joint Commission, the Great Lakes Science Advisory Board reviewed its role and organization in relation to its responsibilities as assigned under the Agreement and by the Commission. Generally, the Board provides scientific advice to the Commission and to the Great Lakes Water Quality Board and develops recommendations on research and science issues related to current and anticipated problems.

In assessing these responsibilities, the Board identified three principal functions:

- Address specific assignments from the Commission and the Water Quality Board under the Commission priorities, as required. The Board has lead responsibility for projects concerned with human and ecosystem health during the present priority cycle.
- Review and evaluate science-related programs conducted under the Agreement. While program review and evaluation are inherent in many activities undertaken within the Commission, they are not the sole responsibility for any one Commission group. For example, the Board views the scientific underpinning of policy related to the U.S. Great Lakes Water Quality Initiative as its most important component; thus, the Board intends to review the initia-

tive and provide advice to the Commission as to its relevance to the Great Lakes Water Quality Agreement.

- The identification of emerging issues and future priorities, a significant strength of the Board in the past, will remain an important role for the future. The Board wishes to continue to develop a science-based approach to priorities, which will also serve to initiate and support the Commission's Priority Planning Group process in the next biennial cycle.

In reviewing its organization structure, the Board created three new workgroups to address the three functions. The workgroups were approved by the Board at its 85th meeting in Cleveland in February 1992 and subsequently confirmed by the Commission at its April Semi-Annual Meeting in Washington, D.C. The Workgroup on Ecosystem Health is co-chaired by Board members Dr. June Fessenden MacDonald and Dr. Rosalie Bertell; the Workgroup on Parties Implementation, which will review progress by Canada and the United States under the Agreement, is co-chaired by Walter Lyon and Dr. Isobel Heathcote; and Dr. John Magnuson and Michel Slivitzky will co-chair the Workgroup on Emerging Issues.

The Board and its workgroups will meet three times per year, with each two-day meeting divided equally between Board and workgroup meetings to facilitate full Board member involvement in all initiatives. In addition, a Coordination Committee was created to coordinate shared activities between the Board and the Council of Great Lakes Research Managers regarding the research mandate of the Board under the Agreement. The Board and the Council will meet jointly once each year to provide an additional opportunity for interaction among all members.

At the Board's recent meeting held May 14-15 in Windsor, Ontario, the new organizational structure was put to the test. The new workgroups focused their efforts on lead responsibilities related to Commission priorities, including a health-related workshop tentatively planned for September 14-15 in Ann Arbor, Michigan entitled "Our Community, Our Health -- A Dialogue Between Science and the Community." The workshop will examine Great Lakes health issues from scientific and community perspectives to develop a common understanding of points of divergence and uncertainty. Case studies and discussions with expert panels of scientists and community leaders are planned.

To address the Commission's priority to identify linkages between human activities and biophysical trends through the process of state-of-the-lakes reporting, the Board is developing a framework based on current "state of the environment" reports. Indicators that would enhance the capability of the Commission to assess the state of the Great Lakes Basin Ecosystem, as required under Article VII of the Agreement, will be identified. This framework will be developed from a review of the latest international, national and regional approaches, and will build on previous work undertaken by the Commission's State of the Ecosystem Task Force. Complete findings will be detailed in the Board's 1993 report.

For more information about the Science Advisory Board, contact Peter Boyer, International Joint Commission, 100 Ouellette Avenue, Eighth floor, Windsor, ON N9A 6T3, telephone (519)256-76821 or P.O. Box 32869, Detroit, MI 48232, telephone (313)226-2170.

Members of the Great Lakes Water Quality Board, 1992

Canada:

Denis Davis, Co-Chair; Environment Canada, Ottawa, ON
 Douglas Dodge, Ontario Ministry of Natural Resources, Toronto, ON
 Denyse Gouin, Québec Ministère de l'Environnement, Québec, PQ
 Joyce McLean, Ontario Ministry of Environment, Toronto, ON
 Robert McMullen, Freshwater Institute, Canada Department of Fisheries and Oceans, Winnipeg, MB
 Doug McTavish, Ontario Ministry of Environment, London, ON
 Gerald Rees, Ontario Ministry of Environment, Toronto, ON
 Peter Toft, Health and Welfare Canada, Ottawa, ON
 E. Tony Wagner, Environment Canada, Burlington, ON

United States:

Valdas Adamkus, Co-Chair; U.S. Environmental Protection Agency, Region V, Chicago, IL
 Mary Gade, Illinois Environmental Protection Agency, Springfield, IL
 Salvatore Pagano, New York State Department of Environmental Conservation, Albany, NY
 Kathy Prosser, Indiana Department of Environmental Management, Indianapolis, IN
 Walter Rittall, Soil Conservation Service, U.S. Department of Agriculture, Washington, DC
 James Rozakis, Pennsylvania Department of Environmental Resources, Meadville, PA
 Frank Ruswick, Michigan Department of Natural Resources, Lansing, MI
 Tim Scherkenbach, Minnesota Pollution Control Agency, St. Paul, MN
 Don Schregardus, Ohio Environmental Protection Agency, Columbus, OH
 Lyman Wible, Wisconsin Department of Natural Resources, Madison, WI

Members of the Great Lakes Science Advisory Board, 1992

Canada:

Ralph Daley, Co-Chair; National Water Research Institute, Environment Canada, Burlington, ON
 Rosalie Bertell, International Institute of Concern for Public Health, Toronto, ON
 Anthony Friend, Institute for Research on Environment and Economy, University of Ottawa, Ottawa, ON
 Isobel Heathcote, University of Guelph, Guelph, ON
 David Hunter, Aird and Berlis Law Firm, Toronto, ON
 Laurie Montour, National Aboriginal Forestry Association, Wendover, ON
 Paul Muldoon, Pollution Probe, Toronto, ON
 Michel Slivitsky, Université du Québec, St-Foy, PQ
 George Werezak, Dow Chemical Canada, Sarnia, ON

United States:

Michael Donahue, Co-Chair; Great Lakes Commission, Ann Arbor, MI
 Anders Andren, University of Wisconsin, Madison, WI
 Timothy Allen, University of Wisconsin, Madison, WI
 June Fessenden MacDonald, Cornell University, Ithaca, NY
 Orie Loucks, Cornell University, Oxford, OH
 Walter Lyon, Engineering Consultant, Camp Hill, PA
 John Magnuson, University of Washington, Seattle, WA
 Milagros Simmons, University of Michigan, Ann Arbor, MI
 Jay Unwin, National Council of the Paper Industry for Air and Stream Improvement, Kalamazoo, MI

BRIEFS

Recently appointed by the International Joint Commission to Canadian co-chair of the Great Lakes Water Quality Board is **Denis Davis**, from the Department of the Environment, Conservation and Protection, Ottawa. Davis replaces David Egar, who held the position from December 1989 to May 1991. The Board also welcomes **Joyce McLean**, Ontario Ministry of the Environment; **Frank Ruswick**, Michigan Department of Natural Resources; **Don Schregardus**, Ohio Environmental Protection Agency; and **Tim Scherkenbach** from the Minnesota Pollution Control Agency.

The Commission also extends its best wishes to **Dr. Jack Vallentyne**, a.k.a. Johnny Biosphere, who retired in March 1992 from Fisheries and Oceans Canada, and **Dr. Alfred Duda**, who served as director of the Commission's Great Lakes Regional Office from August 1988 to December 1991. Dr. Vallentyne served as Canadian co-chair of the Commission's Great Lakes Science Advisory Board from January 1, 1986 to December 31, 1991. Dr. Duda now works on water policy matters at the Environment Department of the World Bank in Washington, D.C.

Participants of the **First World Fisheries Congress**, convened in Athens, Greece, May 3-8, 1992 called for increased collaboration worldwide to improve fisheries research and management. World fish harvests total almost 100 million tons each year, drastically depleting supplies when combined with the effects of decreasing habitat. Reversing this trend and ensuring the long-term quality of fisheries as a source of food, employment and ecological health will require stricter habitat protection, more extensive monitoring and evaluation of management decisions, more attention to the economic and sociological aspects of fisheries industries, and a global perspective.

For more information, contact Dr. Larry Nielsen, Department of Fisheries and Welfare, Virginia Polytechnic Institute, Blacksburg, VA 24061-0321. (703)231-5573.

You are Invited to Comment ... on the first Progress Report concerning Canada-U.S. Transboundary Air Pollution. The report addresses efforts by the two nations to reduce transboundary air pollution under a 1991 Agreement. A synthesis of comments received by the Commission will be provided to the two federal Governments and made available to the public. Interested parties can obtain a copy of the first progress report from the Acid Rain Division, U.S. Environmental Protection Agency, Mail Code: 6204J, 401 M Street SW, Washington, DC 20460, (617)641-5377 or Environment Canada, Enquiries Centre, 351 St. Joseph Boulevard, Hull, PQ K1A 0H3, (819)997-2800.

Send all report comments in writing to the Commission by October 31, 1992:

The Secretary, U.S. Section
International Joint Commission
1250 23rd Street NW, Suite 100
Washington, DC 20440
Telephone: (202)736-9000
Fax: (202)736-9015

The Secretary, Canadian Section
International Joint Commission
100 Metcalfe Street, 18th floor
Ottawa, ON K1P 5M1
Telephone: (613)995-2984
Fax: (613)993-5583

In a recently released report to Congress, the U.S. General Accounting Office (GAO) stated that the **Great Lakes Fishery Commission** will need as much as \$8 million for new tests on chemical lampricides to control the sea lamprey population in the Great Lakes. The Fishery Commission has advised governments since 1956 of critical issues facing the lakes fishery. While funding has been increased recently, the GAO found that it has not been adequate to meet the lamprey challenge. In addition, the lamprey continues to find new habitat for reproduction as water quality improves. Thus, other control techniques may also be required to supplement the successful use of lampricides.

The GAO recognized the Fishery Commission for bringing the Great Lakes fishery back from collapse, and encourages it to take an ecosystem approach to its programs. The Fishery Commission has responded by producing a booklet entitled, **Strategic Vision for the Decade of the 1990s**, which establishes goals for the Fishery Commission based on a holistic ecosystem approach to fisheries management.

For more information on the GAO review or to receive a copy of the booklet, contact the Great Lakes Fishery Commission, 2100 Commonwealth Boulevard, Suite 209, Ann Arbor, MI 48105-1563. (313)662-3209.

Ontario Environment Minister Ruth Grier released in late April a **list of 21 toxic chemicals** as candidates to be banned or phased out in the province. The list was developed as a result of assessments of more than 800 chemicals. Those on the primary list were chosen because of their persistence, level of toxicity and potential to bioaccumulate in the food chain. A second list of 46 chemicals was also developed that are hazardous but less potent.

To receive a copy of the *Candidate Substances List for Bans or Phase-Outs*, contact the Ministry of the Environment, 135 St. Clair Avenue West, Suite 100, Toronto, ON M4V 1P5. (416)323-4359.

A computer bulletin board called **Lake Superior Information** has recently been established by the U.S. Environmental Protection Agency. Those involved in the environmental problems of the Lake Superior basin can access the mini-exchange to communicate with others and to tap a database of technical, legislative and programmatic information. The program can be accessed at (703)505-1025 by any computer equipped with a modem.

Information is available by contacting Susan Boldt, U.S. Environmental Protection Agency, Great Lakes National Program Office, 111 West Jackson, Chicago, IL 60604. (312)353-3565.

In Volume 16, Issue 2, page 5 of *Focus*, we noted a story based on an EPA news release that researchers had discovered that quicklime, a readily available byproduct of limestone, appeared to destroy PCBs in contaminated soil or sludge. Since that time, results published in the November 1991 issue of *Environmental Science and Technology* shows the **quicklime cleanup technique** has just one problem: it doesn't work.

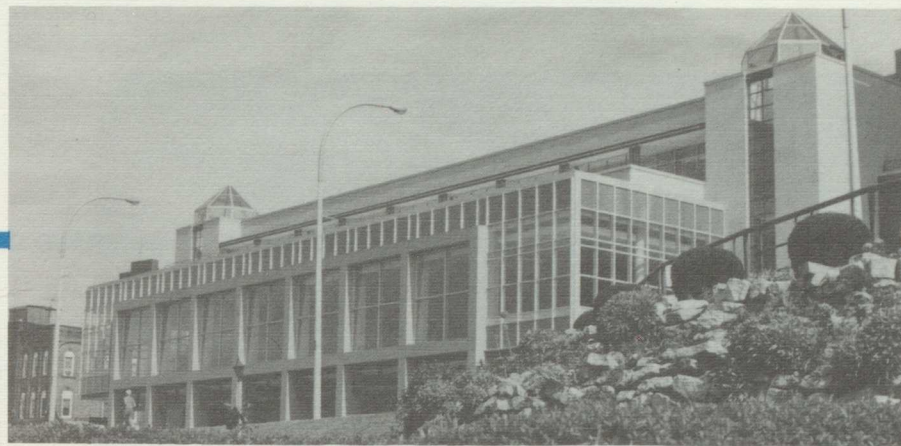
Four researchers from the University of Wisconsin-Madison reported that the precise manner in which quicklime reacted with PCBs, and the chemical components of quicklime that caused the reaction were not identified. In two experiments, they heated PCB-contaminated solids and quicklime together in a flask, and again in simulated field conditions. In both cases, most of the PCBs simply evaporated. The PCBs were transformed from their liquid state into a vapor form and transferred to the air, but were not destroyed.

The relative indestructibility of PCBs has made them one of the most persistent toxic contaminants in the environment today. PCB manufacture in the U.S. was banned in 1976, but half of the 1.4 billion pounds of PCBs produced has already entered the environment, and use and disposal of products containing PCBs continues.

For more information contact University of Wisconsin Sea Grant, 1800 University Avenue, Madison, WI 53705, telephone (608)263-3259.

While one process to destroy PCBs is discounted, researchers at the University of Michigan are exploring the use of **ultraviolet or UV light**, found in natural sunlight, to photodegrade PCBs and related compounds. UV light is capable of breaking down many synthetic organic pollutants, but the amount of ultraviolet light that reaches the earth's surface is relatively small. Powerful lasers, termed pulsed eximer lasers, can produce peak powers of millions of watts, at specific wavelengths, and can be highly focused on a small area. Such intense light energy is capable of destroying PCBs without the addition of other chemicals or catalysts.

Preliminary results using aqueous solutions of Aroclor 1221, a commercial PCB mixture, indicate that the PCBs



Mark Your Calendar ... The International Joint Commission will hold its 1993 Biennial Meeting on Great Lakes Water Quality in Windsor, Ontario, October 22-24, 1993. The community's Cleary International Centre has recently been expanded and updated to ensure plenty of space for all Biennial Meeting functions, and several hotels are located nearby. Look for additional information in forthcoming issues of *Focus*. Credit: Bruce Jamieson

degrade rapidly when exposed to laser light. Researchers hope to determine whether laser destruction might be applicable to PCBs that have been concentrated and extracted from water, soils and sediments, or to PCB mixtures found in electrical equipment such as transformers.

For additional information contact Dr. Stephen J. Parus, Department of Chemistry, University of Michigan, Ann Arbor, MI 48109. (313)936-3818.

On May 11, 1992, Canadian Environment Minister Jean Charest officially opened the **Great Lakes Pollution Prevention Centre** in Sarnia, Ontario. The centre is one component of the Great Lakes-St. Lawrence Pollution Prevention Initiative developed under the \$25-million federal Green Plan program, and will serve as a clearinghouse for information, education and outreach on pollution prevention issues in the Great Lakes region.

For further information on the centre, contact Ray Rivers, Environment Canada, 25 St. Clair Avenue East, Toronto, ON M4T 1M2. (416)973-1098.

The Council of Great Lakes Governors signed a new **Spill Protection Initiative** in mid-May with several oil companies to improve the Great Lakes region's ability to prevent oil spills in the lakes. The pact encourages states and the companies to work together, through a three-phased program, to develop cooperative approaches to spill prevention, assure adequate spill responses, and develop complementary state initiatives to promote spill protection. Marathon, BP Oil, Amoco, Citgo, Koch, Mobil, Sun and Total oil companies joined the eight Great Lakes governors in signing the pact.

To learn more about the agreement,

contact Tim McNulty, Council of Great Lakes Governors, 35 East Wacker Drive, Suite 1850, Chicago, IL 60601, telephone (312)407-0177.

Just when we thought we had seen the worst of the zebra mussel, a second variety of zebra mussel has been discovered in the Great Lakes. Dr. Ellen Marsden of the Illinois Natural History Survey's Lake Michigan Biological Station and Dr. Bernie May of Cornell University recently discovered the second species of zebra mussels in Lake Ontario.

Unlike the original *Dreissena polymorpha*, this new species lacks the flat base, has a much rounder shell and could potentially tolerate a different range of environmental conditions (such as higher temperatures) than the zebra mussel, which invaded North America several years ago. The new species, called the **quagga mussel**, may be one of at least six species of mussels found in Europe. The researchers will study the biology of both zebra mussel species as they monitor their spread across the lakes, and will compare the genetic profile of the new species from various parts of Europe to determine their identity and where they originated.

Because zebra mussels attach to any hard surface, they are difficult to control on water intake pipes. Burying the pipes in sand may be a solution. A new fact sheet, **Sand Filter Intake Could Safeguard Vital Water Supply Systems from Zebra Mussels**, explains this technology. The fact sheet includes diagrams and is available from the Great Lakes Sea Grant Network. Single copies are free. Send your request to Robin Goettel, Illinois-Indiana Sea Grant Program, University of Illinois, 65 Mumford Hall, 1301 West Gregory Drive, Urbana, IL 61801. (217)333-9448, fax (217)333-2614.

At the May 1992 annual meeting of the **Michigan State Medical Society**, members unanimously passed a **resolution in support of zero discharge** of PCB and dioxin compounds in the Great Lakes basin. The resolution recognizes data provided at the Cause-Effect Linkages Symposium held by Michigan Audubon Society last fall in Traverse City, Michigan in conjunction with the Commission's Biennial Meeting and findings in the Commission's *Fifth Biennial Report* as adequate evidence to support and actively encourage the zero discharge goal. The society is the first state medical organization to pass such a resolution.

For a copy of the resolution or to receive additional information, contact the Michigan State Medical Society, 120 W. Saginaw, East Lansing, MI 48826-0950. (517)337-1351.

A new **air monitoring Master Station** has been established off the south shore of Manitoulin Island on Lake Huron to monitor and sample toxic substances found in the air and precipitation of the Great Lakes basin. The station is the last of five Master Stations, one on each of the Great Lakes, built to support initiatives under Canada's Green Plan. Scientists at each site will investigate the role of toxic chemicals in the environment and verify the effectiveness of actions taken to control these substances.

The sites also form the foundation for the Canada-U.S. Integrated Atmospheric Deposition Network, required by the 1987 Protocol to the Canada-U.S. Great Lakes Water Quality Agreement. The surveillance network will acquire information on the nature and amount of toxic substances entering the Great Lakes from the atmosphere, as well as identify and control emission sources.

To receive further information on the Great Lakes air monitoring sites, contact Karen Looye, Office of the Minister of State, Environment Canada, 10 Wellington Street, 27th floor, Hull, PQ K1A 0H3. (819)953-0717.

A new shipboard education project is underway as part of the **Clinton River/ Great Lakes Education Project**. Classrooms of students spend a day on board the 45-foot cruiser "The Clinton," learning about the land, water, life and

people of the Clinton River and Lake St. Clair. Fourth-grade students have been selected to participate in the program to correlate with the State of Michigan's education models, which emphasize the Great Lakes for that age group.

The project provides a three-part educational experience for students and their teachers. Classroom activities familiarize students with the Great Lakes system; hands-on experiences acquaint participants with the physical, chemical, biological and cultural aspects of the Clinton River and Lake St. Clair; and classroom activities reinforce the concepts learned in the previous experiences.

For more information on the Clinton River project contact Steve Stewart, 21885 Dunham Road, Mt. Clemens, MI 48043. (313)469-6085.

After three years of research and testing in Lake St. Clair, a Canadian company partly owned by the Ontario Government has produced several products that are effective in controlling zebra mussels from attaching to boats and other marine equipment. **Zebra Wax**, a combination of silicone polymers, makes the surface of a boat, trailer or underwater dock surface so slippery that the mussels have trouble adhering to it. A single application will last one summer, and the product has not been found to be toxic to other aquatic species.

For further information, contact Bill Milne, Alex Milne Associates, 376 Orenda Road East, Brampton, ON L6T 1G1. (416)790-0440, fax (416)790-0455.

The **National Environmental Technology Applications Corporation** (NETAC) is a nonprofit organization dedicated to accelerating the development, application and commercialization of priority technologies for national and international markets. Headquartered in Pittsburgh, Pennsylvania and established in 1988 under a cooperative agreement between the U.S. Environmental Protection Agency and the University of Pittsburgh, NETAC combines the resources of industry, government and academia to provide a variety of business and technical products and services that help technology developers succeed in bringing new technologies to the marketplace.

NETAC has established a toll-free

commercialization assistance hotline to support technology developers. Callers can obtain information about potential funding sources, federal and state assistance programs, and the commercialization process. U.S. residents can access the hotline by calling 1-800-48-NETAC. In Canada, call 412-826-5511.

A student of art history in Minnesota has developed a technique to **re-create wood** out of fibers. Any paper product -- newspapers, magazines, telephone books, milk cartons -- can be turned into wood-strength bricks using a steel, box-shaped machine called a tumbler, which breaks down the fibers with water into a slurry. A handmade hydraulic press then applies 100 pounds-per-square-inch pressure to create bricks that are equal in strength to an equivalent block of pine. The process is still being tested to determine the potential for construction use.

For more information on the re-creation of wood, contact Stanley Shetka, c/o the World Art Project, 10247 40th Street West, Webster, MN 55088. (507)744-2913.

The **Adopt-a-Watershed** environmental education program is getting young people excited and involved in river and streambank habitat. Students learn about a watershed, identify a problem and act on that problem. Hands-on projects such as reforestation and cleaning up debris are actions many students take as a result of their participation.

The Little River project in Windsor, Ontario, for example, began with one school and soon spread to include all the staff, students and parents of four elementary and one high school in the community.

Signs have recently been erected at the site recognizing the group's cleanup and reforestation efforts. As well, during Windsor's Centennial Celebration in May, Little River was dedicated as a centennial forest, with a plaque to that effect unveiled by His Excellency Ramon J. Hnatyshyn, Governor General of Canada.

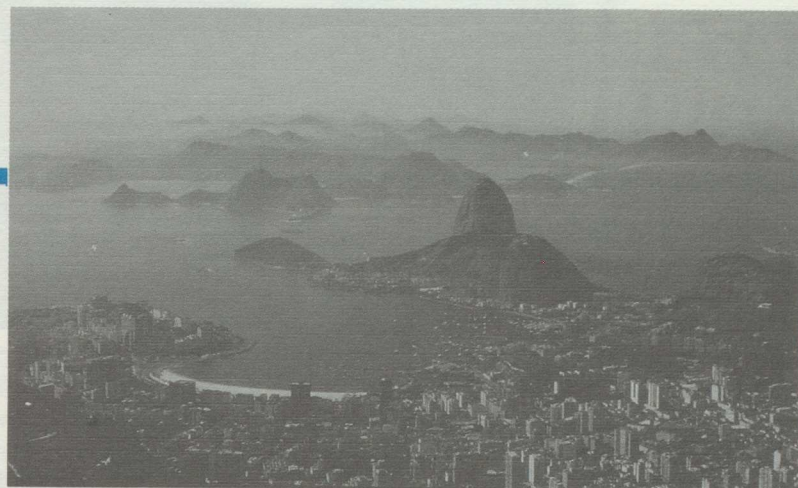
For more information on the Little River enhancement project write to Ian Naisbitt, Concord Public School, 6700 Raymond Avenue, Windsor, ON N8S 2A1.

IJC Participates in Rio Summit

Note: The International Joint Commission's U.S. Chairman, Gordon Durnil, and Canadian Section Economics Advisor Geoffrey Thornburn attended the United Nations Conference on Environment and Development in Rio de Janeiro, Brazil, in June. Also called the Rio Summit, the conference brought together the world's political leaders and thousands of scientists, activists and others to develop a global agenda for environmental protection. While there, Chairman Durnil presented the following speech to a plenary session on June 9, 1992.

The International Joint Commission of the United States and Canada appreciates the opportunity to participate as an intergovernmental organization in this important conference. We expect that these discussions will help to chart the course of environmental action for several decades to come.

Joining me at this conference is Mr. Geoffrey Thornburn, an advisor to the Canadian Section of the Commission.



Aerial view of Rio de Janeiro, Brazil. Below, the site of the United Nations Conference on Environment and Development. Credit: Geoffrey Thornburn

The International Joint Commission was established and named by the Boundary Waters Treaty of 1909, a treaty which set out principles and mechanisms to prevent disputes regarding the use of boundary waters and to settle other questions along the common boundary between Canada and the United States. Thus, the International Joint Commission has some 80 years of continuous experience in helping to resolve transboundary environmental issues.

Representatives of the International Joint Commission were present at the Stockholm Conference in 1972. That year also marked the signing, by the President of the United States and the Prime Minister of Canada, of the first Great Lakes Water Quality Agreement. It was a pioneering binational Agreement, since renewed and extended, which set out objectives and programs for the restoration and protection of the Great Lakes. It followed extensive studies by the Commission that had led to a realization of the seriously degraded and threatened condition of the Great Lakes. Since then, we have watched and participated in the tremendous evolution of environmental

understanding and action at the global, and particularly at the regional and binational levels.

The Great Lakes - St. Lawrence River basin is the largest system of fresh surface water on earth -- 20% of the world's fresh water, with 10,000 miles of shoreline. It provides drinking water to approximately 25 million people as well as many other beneficial uses.

Our perspective is thus one that is both historical and contemporary. The Commission has the benefit of broad experience covering a large number of issues along the common boundary, since its first major study in 1912. For the last 20 years, it has had continuing responsibilities to the Governments of the United States and Canada to monitor and report on the condition and needed programs pertinent to Great Lakes water quality, pursuant to the Great Lakes Water Quality Agreement.

I would like to highlight a few key lessons from this experience:

- The International Joint Commission is a permanent, unitary body that is independent from the policies of the two national governments. It has jurisdiction to issue Orders of Approval governing certain works in boundary and transboundary waters. In issues concerning environmental quality, however, it has no executive or implementing powers (except over its own procedures). It is limited to the preparation of reports, including recommendations, on



Belgium signing the
Climate Change Convention.
Credit: Geoffrey Thornburn



matters referred by the Governments. However, in practice, the vast majority of these recommendations have, over time, either been directly accepted or have pointed the way for a longer term evolution of policy and practice.

- As an established organization, the Commission provides a mechanism and an accumulated body of knowledge that are available instantly to assist Governments in preventing and resolving issues that may arise along the boundary, within clearly defined parameters.
- Six Commissioners are appointed, three by the President of the United States with the approval of the Senate, and three by the Governor General in Council of Canada. However, we serve collegially, not as representatives of our governments. We have a relatively small permanent staff to assist in administration, interpretation of research findings and the preparation of reports, but rely heavily on binational teams of experts, created for specific tasks and drawn from the various government services and increasingly also from nongovernmental organizations, to develop the scientific basis for our findings. These experts are required to serve in their personal and professional capacities.

One of the major successes over the years has been our process of bringing together the best available expertise to develop a consensus on the fundamental data to describe a particular problem and its practical solutions. This process has also resulted in the development of a large binational cadre of experts who know and respect each other. Those relationships have lasting value beyond the Commission process itself.

As noted earlier, the Commission, when acting in an advisory capacity,

has neither the opportunity nor the inhibitions associated with the power and responsibility to implement and enforce its findings. That prerogative remains with the sovereign governments. Thus, Commissioners with their advisors can explore creative avenues to resolving disputes and charting courses of action, without being bound by existing national policies. On the other hand, recommendations from the Commission can form a strong basis for Governments to modify policies that may otherwise seem fixed for a variety of reasons.

One other factor has been crucial to the Commission's ability to influence through its process: direct public involvement. The Commission has always placed considerable importance on an informed and involved public, and was one of the first bodies with a strong mandate and procedural rules requiring public consultation, traditionally through formal public hearings. Under the Treaty and our Rules, all interests have a right to be given a convenient opportunity to be heard, a requirement that is subject to cultural realities and to which we are continually seeking to be responsive. (Comme exemple, nous fournissons des informations et autres services aux Canadiens dans les deux langues officielles du Canada.)

We have, in recent years, been experimenting with a number of new, more dynamic procedures for direct public participation, including roundtables and live-by-satellite television conferences involving people in a number of communities around the Great Lakes. Without the support of the public, and its involvement in the process leading to recommendations (especially in controversial subject areas), the

Commission's ability to influence governments would no doubt be weaker.

We have come to realize that two fundamental attributes of our approach to resource and environmental questions are crucial:

- (1) There is a need to take a systematic, comprehensive approach to issues, rather than a reductionist, piece-by-piece approach which has tended to characterize -- and continues to limit -- traditional governmental and scientific action on issues that are generally complex and interconnected. While for pragmatic purposes problems need to be broken down, the development of effective environmental strategies needs a broad, inclusive approach that we call an "ecosystem approach." Thus, for example, air, water, forestry, land use, economic, social and institutional issues are all interrelated. We cannot afford to ignore possible linkages. We also can no longer afford to isolate economic and social goals from environmental goals. They are linked, neither one subsidiary to the other.

This fact is recognized in the theme of this World Conference, but it is so easy to retreat to narrow perspectives and decisionmaking within the limited mandates of individual agencies. If nothing else, this conference must leave delegates with the ingrained realization that all the issues being addressed here are interconnected and cannot be resolved in isolation one from the other. Humans must work together across sectoral, national, political, sociological and other boundaries to resolve shared, if sometimes differently experienced problems.

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(2) Complex problems cannot be solved, or even understood, unless all interested parties and perspectives are meaningfully involved --- governments at all levels (local, regional and national), industry, labor, environmental, religious and social organizations, the media, medical and educational professionals, other major groups, individual consumers and producers, and so on. Thus, in addition to recognizing the intrinsic value of public involvement, we have found that conversing with a broad spectrum of knowledgeable interests is crucial to gaining a comprehensive knowledge of the issues in which we are engaged. An important element in nurturing widespread involvement and commitment is environmental education, at all levels, an area in which we have been encouraging the concerted attention of governments and professional educators.

Mechanisms must be found to bring these interests together to address the environmental and developmental issues of the day in an effective way, and to reach a consensus and shared commitment on the action required. The Commission has recent experience in this area, for example, with the procedures for developing Remedial Action Plans for some 43 severely degraded local Areas of Concern around the Great Lakes.

We at the International Joint Commission believe that we have had and continue to enjoy a unique opportunity to learn, and that we have a wealth of experience that may be helpful to governments as they seek, individually and collectively, mechanisms to address the difficult issues ahead. We would be pleased to share this experience with other delegates, either informally at this conference, or later. We have also come to learn from your experiences and about your commitment to a better world. We wish all of you success in this important work.

Progress Review Meetings Held for Levels Reference Study

The Levels Reference Study Board held three Progress Review meetings during May, where comments and guidance from citizens were received on draft technical studies. The meetings were held May 4 in Baraga, Michigan, May 12 in Toledo, Ohio, and May 27 in Burlington, Ontario. Progress was reported on the following topics:

1. Natural Resources

Coastal wetlands are the most productive and diverse component of the Great Lakes - St. Lawrence River ecosystem. The productivity, biological composition and size of Great Lakes wetlands are a reflection of the long-term water level regime. Coastal wetlands are an important type of fish and wildlife habitat in the Great Lakes system and these are areas where lake level changes have the greatest ecological effect.

The health of wetlands, in many respects, is an indicator for the health of the coastal environment as a whole. To assess the impacts of water level fluctuations and potential measures on wetlands, a number of activities were undertaken. Thirty-four wetland sites along the U.S. shores of Lakes Ontario and Superior were studied to identify the relationship between water levels and the diversity and specific needs of plant communities. The results have been used to project the effects of potential water level regulation schemes on wetlands.

Air photography data over a forty-year period were gathered for seven

sites on the Ontario shoreline, and a similar project was completed for three sites on Lac St. Louis on the St. Lawrence River. Using computer analysis, information for a number of different years was overlaid and historic changes were documented. The results assess whether the historic changes in these wetland sites can be attributed to water level changes.

A conceptual model of wetland plant community response was used to illustrate the general response of wetlands to changes in water levels and specifically to a reduced range in water levels that would result from various lake level regulation possibilities. Results from the wetland studies were used as general indicators for fish and wildlife habitat. To enhance this information, existing fish habitat data for Saginaw Bay and a site in the Bay of Quinte were examined. Variations in fish habitat that might occur as a result of fluctuating water levels have been evaluated.

2. How Water Level Changes Affect Shoreline Erosion

One objective of the Erosion Processes Task Group of Working Committee 2 was to examine how water level changes affect erosion rates of various shoreline types found in the basin. To accomplish this, the task group conducted two tasks.

The first was a comprehensive Shoreline Classification and Mapping Project, which identified the various shoreline types that exist in the basin. The classification scheme takes a three-tiered approach which considers: 1) the above-water shoreline type (e.g. bluff, beach); 2) the level of shoreline protection (e.g. heavily protected, no protection); and 3) the below-water shoreline type (e.g. clay, sand). Results of this classification were put into a Geographic Information System (GIS) which allows for the production of

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detailed shoreline classification maps and the generation of useful data, such as the total length of shoreline that is heavily protected, or the total length of a particular shoreline type.

The second activity was an evaluation of how identified shoreline types respond to changes in water levels. A series of shoreline types, and their associated "profile" data (i.e. their shapes), along with water level data from a number of water level regulation scenarios, were entered into a computer model that predicts changes in the profile shape with changes in water level. The effects of a 25% and 50% reduction in the range of water levels were evaluated. Results of these evaluations provided the task group with data on long-term recession rate change for each shoreline type, if the range of fluctuations was reduced. This data was used to identify those areas along the shoreline where this recession rate reduction is significant.

3. Land Use and Management

One objective of the Land Use and Management Task Group was to catalogue shoreline uses, trends in land uses and the use of shoreline management practices. This work served as an information base for this and other task groups. The task group also evaluated the effectiveness and applicability of selected shoreline management practices. The selected practices for evaluation were:

Regulatory Based Practices

Set Backs
Elevations
Habitat Protection Requirements



Long-time Baraga resident Norm Hiltunen leads the Levels Reference Study team in a bus tour of points of interest around Keweenaw Bay on the south shore of Lake Superior. The team visited Baraga on May 4 to hold a public Progress Review Meeting which focussed on the impacts of fluctuating water levels on wetlands and fish habitat. The tour was arranged by Howard Reynolds, a resident of Baraga and representative of the Keweenaw Bay Indian Community. Mr. Reynolds is also a member of the Study's Citizens Advisory Committee.

Shore Alteration Requirements
Deed Restrictions
Development Controls for Public Infrastructure
Nonstructural Land Use Practices (e.g. acquisition)

Incentive Based Practices

Tax Incentives/Disincentives
Loans
Grants
Insurance

Shoreline Protection Alternatives

Local, large-scale structural community protection projects
Local, large-scale, nonstructural community protection projects

Results of this evaluation assisted in identifying possible shoreline management measures that could help to alleviate problems associated with fluctuating water levels.

4. Potential Damages

The main objective of the Potential Damages Task Group was to address the damages that could be caused by both high and low water conditions. To date, the following tasks have been conducted:

- Six reach studies were undertaken on the U.S. shoreline to update existing stage-damage curves and add 1985-1990 damages. These studies involved collection of detailed data on recent shoreline damage, new development, and shore protection along particular stretches of shoreline on Lakes Michigan, Huron, Erie, St. Clair and Ontario.
- Existing Canadian stage-damage curves were updated to take into account such things as inflation and increased property values. These curves estimate dollar damages that would be caused by progressively higher or lower water levels.
- A critical assessment of these stage-damage curves was undertaken to determine how best to apply them in the current study process.
- Thirteen U.S. and Canadian sites were studied in detail for flooding, erosion, water level extremes and the effects of various types of lake level regulation.
- Known data on the rates at which shorelines have receded was gathered for both the U.S. and Canadian shorelines to support the determination of potential erosion damages.
- Past expenditures for shore protec-

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tion for the 1985-1987 water level period were compiled, based primarily on existing documents.

- Future avoided costs of shore protection under regulation scenarios were determined for the entire Great Lakes - St. Lawrence River Basin. These are currently forecast costs that could be made unnecessary by possible lake level regulation schemes.

5. Crisis Conditions

In the last 30 years, the Great Lakes-St. Lawrence River region has undergone three water levels crises, ranging from the extreme lows of 1964 to the extreme highs of 1973-1974 and 1985-86. Some people who live and work on the Great Lakes suffered losses as a result of these extreme water level fluctuations. Extremely low levels cause docking problems, difficulties for water intake and sewage treatment facilities, reduce safe channel depths, and affect hydropower production. Extremely high levels can cause shoreline property damage, reduce docking and bridge clearances for ships, and flood municipal infrastructures.

Extremely high levels can cause shoreline property damage, reduce docking and bridge clearances for ships, and flood municipal infrastructures.

One of this study's tasks is to propose possible short-term measures that could be taken in high or low water level emergencies to help alleviate these adverse effects. These proposed measures are called Crises Condition Responses. The group responsible for developing these emergency actions has defined Crisis Threshold Levels, the water levels (either high or low) beyond which major damages begin to

occur. Trigger levels -- levels at which crisis condition responses will be required -- were defined as well.

Planning for crisis responses requires assessment of the range of actions that could be taken in order to weigh their beneficial effects against their detrimental effects. Both hydraulic actions (actions that will alter water levels or flows) and land side measures (actions that would prevent damage from occurring, or protect from water level extremes) were considered. Possible crisis condition responses were limited to actions that are considered temporary or reversible, that can be implemented within one year, and that can last for up to three years.

Report Issued on Recommended Communications Program

The Public Participation and Information Working Committee (Working Committee 1) endorsed a recommendation by an earlier communications task group to establish a binational Water Levels Information Clearinghouse. The recommendation responds to one of the study's responsibilities, which was to develop an information program that governments can use to better inform the public about changing water levels. This recommendation and supporting ideas were discussed in a draft report that was reviewed by the Study Team, Citizens Advisory Committee, and the general public. Comments were taken into consideration as much as possible, and the committee's recommendations were finalized in June.

The recommendation for a binational Information Clearinghouse was first made by a Communications Task Group established in 1989, near the end of the study's first phase. In a

report to the Levels Reference Study Board of Phase II, the group had suggested that such a clearinghouse be established at the Commission's Windsor, Ontario office. Working Committee 1 was asked to review this report and make further recommendations.

Draft Evaluation Criteria Proposed

Part of the study's work involves development of an evaluation framework to compare and rank potential measures (actions to alleviate the adverse consequences of fluctuating water levels). Important components of this framework are the evaluation criteria, the standards by which all measures will be compared.

After consultation among study participants, a document on proposed evaluation criteria was prepared by Working Committee 4 and reviewed by the public. Comments were to be submitted by May 27, and were considered at a workshop in the first week of June. All information prepared by the working committees will help to determine how well potential measures meet the evaluation criteria.

Four core criteria have been proposed, each of which will be accompanied by several subcriteria:

1. **Economic Impact** on the Great Lakes - St. Lawrence River basin, in terms of costs versus benefits, other economic effects and social perspectives.
2. **Environmental Impact** on the basin, from wetland and shoreline perspectives.
3. **Fairness** of a measure, based on its allocation of favorable or unfavorable impacts across economic, environmental, regional and social interests.
4. **Implementation** criteria about potential hurdles to a measure's implementation.

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When the evaluation criteria are final, the study will move into the **Multi-Criteria Evaluation Process**, which will lead to the recommendations of the final report.

Public Forums This Fall and Winter

As the study progresses, public forums allow citizens to comment on draft findings and conclusions, and on the study's draft recommendations. Four public forums will be held in November and December to discuss the findings and conclusions of the study. Input from these forums will be used to help draft the final report's recommendations. The forums will be held:

November 30, 1992 in
THUNDER BAY, ONTARIO
December 1 in
MILWAUKEE, WISCONSIN

December 2 in
SARNIA, ONTARIO
December 3 in
OSWEGO, NEW YORK

Four additional public forums will be held in February 1993 before all recommendations are finalized. These are scheduled for:

February 22 in
SAULT STE. MARIE, ONTARIO
February 23 in
CHICAGO, ILLINOIS
February 24 in
BUFFALO, NEW YORK
February 25 in
DORVAL, QUEBEC

Please check with the listed contacts for more information.

The study's final report is scheduled for completion in March 1993, when it will be presented to the Commission.

The Commission will then review the report, and present its own report and recommendations to the Governments of Canada and the United States.

Direct your comments and inquiries on the Levels Reference Study to:

In Canada:

Ruth Edgett
Levels Reference Study
c/o Great Lakes Water Level
Communications Centre
Environment Canada
P.O. Box 5050
Burlington, ON L7R 4A6
(416) 336-4581/4629

In the United States:

Anne Sudar
Levels Reference Study
c/o Institute for Water Resources
U.S. Army Corps of Engineers
Casey Building
Fort Belvoir, VA 22060-5586
(703) 355-2336

Long History of Commission Involvement in St. Croix River

by Rudy Koop and Don Parsons

Since 1912, the International Joint Commission has been directly involved in the Maine-New Brunswick area, as part of its responsibilities under the Boundary Waters Treaty to respond to requests from the Canadian and U.S. Governments to carry out studies, and to deal with applications requesting permission to construct or alter dams or fishways. Much of the attention in this region has focused on the St. Croix River basin.

In 1912, the newly established Commission was asked to examine several rivers and lakes along the international boundary, and to report on the extent, causes and location of pollution in these boundary waters. In the St. Croix River, the Commission found that chemical waste resulting from the manufacture of pulp was polluting the river, and that this form of pollution was injurious to fish life and the fishing industry. However, the general belief at that time that there was an inexhaustible supply of clean, fresh water to dilute all wastes, and the advent of chlorination of municipal water supplies, allayed a sense of urgency to expend large sums of money on waste treatment. Governments therefore did not give any further direction or authority to the Commission with respect to the pollution of these waters, even though, in hindsight, there is little doubt that

pollution was a contributing factor to the demise of the once-famous Atlantic salmon in the St. Croix River.

A few years later, in 1915, the Commission approved the construction of a dam and power canal at Grand Falls, and established the International St. Croix River Board of Control to supervise and regulate the operation of these works. The St. Croix Board is one of the Commission's oldest boards, and its responsibilities have expanded to include responsibility for the dams at Forest City, Vanceboro and Milltown, as well as a number of fishways in the river. It recently assisted the Commission in a preliminary review of concerns regarding regulation of water levels, particularly for Spednic Lake. This issue is complicated by the different water level and flow requirements of the various uses of the lake, such as recreation, tourism, fisheries and industry. There are times,



Power Plant at Grand Falls, St. Croix River, New Brunswick

times, particularly in dry periods, when even the best efforts cannot satisfy all users of the waterway. One of the keys to the successful multiple use of the St. Croix River is the series of dams and reservoirs on the river, which enables flood peaks to be stored and periods of low flow to be augmented. This regulation is crucial to the current level of multiple use and future management of the resource.

The Commission's current activities in water quality of the St. Croix basin began in 1955, when Governments asked it to study the water resources of the basin and to recommend improvements in the use, conservation and regulation of the basin's waters. When the study was completed in 1961, the Governments adopted the water quality objectives recommended by the Commission, and agreed to implement pollution abatement measures to meet these objectives. The Commission monitors water quality through a technical advisory board, which also investigates the possible restoration of salmon to the river. Since 1962, the Commission's St. Croix River Advisory Board on Pollution Control has reported on the river's water quality and pollution abatement efforts made by industries and municipalities along the river.

Water quality has improved significantly since 1962, when the Board

characterized the St. Croix River as severely polluted by untreated discharges of domestic and industrial wastes. By 1977, several industrial and municipal pollution control systems had been installed, and the Commission concluded that water quality had improved to the point that programs to restore the salmon fishery could begin. It was not long afterward that, aided by continued improvements in water quality, heightened environmental awareness by industries and communities along the river, improved fish passage facilities and cooperative American and Canadian fish stocking programs, the first salmon runs occurred since the 1950s. While the number of returning salmon is still modest and some water quality and quantity problems hindering fish passage still remain, the Commission is encouraged that initiatives are showing positive results.

In addition to its ongoing work in monitoring pollution control activities, the Board has also assessed changes in the health of the St. Croix ecosystem using salmon or other indicators, and recommended additional programs to correct environmental problems in the St. Croix River. The Board is considering factors that inhibit salmon restoration, and bacterial contamination that has resulted in closing a major section of the estuary to commercial shellfishing.

Through the efforts of its International St. Croix River Board of Control and St. Croix River Advisory Board on Pollution Control, the Commission has had a long and largely successful involvement in issues concerning the water resources of the St. Croix River. Some problems remain, and there is still much to be done. But the St. Croix River now supports a number of major users, including inland fisheries, a re-established salmon fishery, shell-fishing, recreation, and municipal and industrial use. Each has its own requirements in terms of water quantity and quality, and sometimes there are conflicting demands. It is encouraging, however, that the various users, federal, state and provincial agencies and others are cooperatively discussing and addressing water quality and quantity problems for the benefit of all.

Consistent with Commission policy, both St. Croix boards will hold public meetings in the upper and lower St. Croix River basin in mid-August. For more information about these meetings and the Commission's responsibilities in that region, contact Rudy Koop, International Joint Commission, 100 Metcalfe Street, 18th floor, Ottawa, ON K1P 5M1, telephone (613)995-2984 or Don Parsons, International Joint Commission, 1250 23rd Street NW, Washington, DC 20440, telephone (202)736-9005.

La Commission est engagée depuis longtemps dans la gestion du Bassin de la rivière Sainte-Croix

par Rudy Koop et Don Parsons

La Commission mixte internationale s'intéresse directement à la région du Maine et du Nouveau-Brunswick depuis 1912, c'est-à-dire trois ans suivant la signature du Traité relatif aux eaux limitrophes, qui lui donne pour mandat de procéder aux études commandées par les gouvernements du Canada et des États-Unis et de traiter les demandes de permis de construction ou de modification des barrages ou des passes à poissons. C'est la rivière Sainte-Croix qui a surtout retenu l'attention dans cette région frontalière.

En 1912, les gouvernements demandaient à la Commission, qui venait tout juste d'être créée, d'étudier plusieurs rivières et lacs le long de la frontière internationale, et de faire rapport sur l'étendue, les causes et l'emplacement de la pollution dans ces eaux limitrophes. Dans le cas de la rivière Sainte-Croix, la Commission a constaté que les résidus chimiques de la fabrication de pâte à papier polluaient la rivière au point de mettre en danger la vie des poissons et la survie de l'industrie de la pêche. À cette époque, on croyait que les ressources en eau douce propre étaient inépuisables et pouvaient diluer tous les déchets, et avec l'arrivée de la chloration des réserves d'eau municipales, la nécessité d'investir massivement dans le traitement de l'eau ne s'est plus fait sentir avec autant d'urgence. Les gouvernements

n'ont donc pas demandé à la Commission d'approfondir la question de la pollution de ces eaux, même si, rétrospectivement, il subsiste peu de doute sur la contribution de ce facteur à la disparition du saumon de l'Atlantique qui prospérait autrefois dans les eaux de la rivière Sainte-Croix.

Quelques années plus tard, en 1915, la Commission approuvait la construction d'un barrage et d'un canal usinier à Grand Falls, et créait le Conseil international de contrôle de la rivière Sainte-Croix, qu'elle chargeait de réglementer et de surveiller l'exploitation de ces ouvrages. Le Conseil de la rivière Sainte-Croix, l'un des plus anciens de la Commission, a vu ses responsabilités s'accroître avec la construction des barrages de Forest City, Vanceboro et Milltown et avec l'aménagement de passes à poissons dans la rivière. Dernièrement, le Conseil a également participé avec la Commission à l'examen préliminaire des préoccupations de plusieurs organismes au sujet de la régulation des niveaux d'eau, en particulier ceux du lac Spednic. Le fait que les diverses utilisations du lac - tourisme, loisirs, pêche, industrie, etc. - exigent des niveaux et des débits d'eau qui diffèrent vient compliquer la gestion de ce bassin. Il arrive ainsi parfois, surtout en période sèche, qu'il soit malgré tout impossible de satisfaire tous les usagers du cours d'eau. La série de barrages et de réservoirs construits sur la rivière est l'un des éléments majeurs qui expliquent les multiples utilisations de ce cours d'eau. Ces ouvrages permettent en effet de stocker l'eau des périodes de crue et d'augmenter le débit de la rivière en période de sécheresse. Cette régulation du débit est cruciale pour le maintien des multiples utilisations actuelles et pour la gestion future de la ressource.

Les activités actuelles de la Commission dans le bassin de la rivière Sainte-Croix ont débuté en 1955, lorsque les gouvernements lui ont

demandé d'étudier les ressources en eau du bassin et de recommander des mesures afin d'en améliorer l'utilisation, la conservation et la régulation. À la fin de l'étude, en 1961, les gouvernements ont adopté les objectifs de qualité de l'eau recommandés par la Commission, et ont convenu d'appliquer des mesures antipollution afin d'atteindre ces objectifs. La Commission a confié la surveillance de la qualité de l'eau à un conseil consultatif technique, qui fait également enquête sur les possibilités de rétablir le saumon dans la rivière. Depuis 1962, le Conseil consultatif de lutte contre la pollution de la rivière Sainte-Croix fait rapport sur la qualité de l'eau de la rivière et sur les efforts de dépollution des entreprises et des municipalités riveraines.

En 1962, le Conseil déclarait que la rivière était gravement polluée par les rejets non traités des eaux usées domestiques et industrielles. La qualité de l'eau s'est grandement améliorée depuis. En 1977, par suite de l'installation et de l'exploitation de plusieurs systèmes antipollution par les municipalités et l'industrie, la Commission concluait que la qualité de l'eau s'était suffisamment améliorée pour qu'il soit possible d'entreprendre la restauration de la pêche au saumon dans la rivière. Peu de temps après, grâce à l'amélioration continue de la qualité de l'eau, à la sensibilisation accrue des entreprises et des collectivités riveraines aux questions environnementales, à l'aménagement de passes à poissons mieux adaptées et à des programmes coopératifs d'ensemencement de poissons par le Canada et les États-Unis, on assistait à la première remonte de saumons à se produire depuis les années 1950. Même si le nombre de saumons qui reviennent est encore peu élevé, et malgré certains problèmes de quantité et de qualité de l'eau qui nuisent au passage du poisson, la Commission constate avec encouragement que des efforts



La rivière Sainte - Croix, Nouveau-Brunswick

amorcés il y a plus de 25 ans débouchent sur des résultats positifs.

Outre la surveillance des activités de dépollution, le Conseil a aussi procédé à l'évaluation de l'écosystème de la rivière Sainte-Croix, en se servant du saumon et d'autres indicateurs pour recommander des programmes supplémentaires en vue de corriger les problèmes environnementaux de ce cours d'eau. Le Conseil étudie les facteurs qui inhibent la restauration du saumon ainsi que la contamination bactériologique qui a entraîné la fermeture d'une partie importante de l'estuaire à la pêche commerciale aux coquillages.

Grâce aux efforts du Conseil international de contrôle de la rivière Sainte-Croix et du Conseil consultatif de lutte contre la pollution de la rivière Sainte-Croix, la Commission s'occupe depuis longtemps, et avec succès, des questions touchant les ressources en eau de cette rivière. Tous les problèmes ne sont cependant pas encore réglés, et beaucoup reste à faire. La rivière Sainte-Croix sert aujourd'hui à de nombreuses et importantes fins, notamment la pêche en eaux intérieures, la pêche au saumon nouvellement restaurée, la

cueillette de coquillages, les loisirs ainsi que les activités des municipalités et des entreprises. Chaque utilisateur a des besoins particuliers sur les plans quantitatif et qualitatif, et les demandes sont parfois conflictuelles. Il est cependant encourageant de constater que les divers utilisateurs, les organismes fédéraux, des États et des provinces chargés de gérer la rivière et les autres intervenants discutent des problèmes de qualité et de quantité de l'eau et trouvent des solutions pour le bénéfice de tous.

Conformément à la politique établie, les deux Conseils de la rivière Sainte-Croix achèvent actuellement la préparation de plans pour la tenue, à la mi-août, de réunions publiques dans les bassins supérieur et inférieur de la rivière. Pour obtenir de plus amples renseignements sur ces réunions et sur les responsabilités de la Commission dans cette région, on peut communiquer avec Rudy Koop, Commission mixte internationale, 100 rue Metcalfe, 18^e étage, Ottawa (ONT.) K1P 5M1, téléphone : (613) 995-2984 ou avec Don Parsons, International Joint Commission, 1250 23rd Street NW, Washington, DC 20440, téléphone : (202) 736-9005.

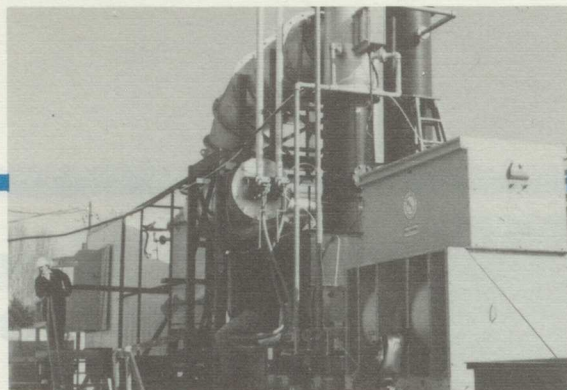
Treatment Technology Program Created for Contaminated Sediments

by Craig Wardlaw and Paul Bucens

Environment Canada's Great Lakes Cleanup Fund, one component of the federal Great Lakes Action Plan, was initiated in 1991. The program focuses on Canada's 17 Areas of Concern identified by the International Joint Commission, and is designed to help meet federal commitments to develop and implement cleanup options for each site. One priority of the program is to develop and demonstrate new and innovative technology for the safe removal and treatment of contaminated sediments. To do this, the Contaminated Sediment Treatment Technology Program (CoSTTeP) was initiated.

Environment Canada's Great Lakes Environment Office contracted with the Wastewater Technology Centre, a federally owned, privately operated institution dedicated to developing and commercializing promising technologies for wastewater treatment and environmental protection, to administer CoSTTeP. The mandate of CoSTTeP is to foster the development and demonstration of technologies to remediate contaminated sediment and to communicate the results of the program to persons involved in Great Lakes remediation projects. Funds provided by the Cleanup Fund are used to sponsor technology demonstration projects that have excellent technical merit, are innovative and have the potential to treat Great Lakes sediment in a cost-effective manner.

The CoSTTeP program is budgeted to run until 1995. The projected annual



The EcoLogic Thermal Destructor pilot unit at Hamilton Harbour.

budget for the first five years is shown in Table 1.

Table 1 PROGRAM BUDGET

Fiscal year	Program Stage	Budget
1990/91	Bench Scale*	\$ 450
1991/92	Bench/Pilot	1,300
1992/93	Bench/Pilot	1,100
1993/94	Pilot/Full Scale	1,500
1994/95	Full Scale	1,600
TOTAL		\$5,950

*Bench scale refers to experiments using 20 to 50 liters of sediment; pilot scale to 50-1,000 liters; and full scale to more than 1,000 liters.

At the outset of the program, national and international advertisements were placed to obtain "expressions of interest" from vendors of technologies applicable to the remediation of contaminated sediment. Approximately 180 technologies have been reviewed thus far, and summaries of each technology have been compiled in a "hardcopy format" sediment treatment technologies database. For comparison, the technologies were classified into eight technology categories: fixation/stabilization, extraction, chemical treatment, biological treatment, conventional incineration, alternative heat processes, pre/post-treatment, and other technologies.

Of the technologies reviewed, 15 bench scale and four pilot scale demonstrations have been initiated to date (two pilot scale demonstrations have yet to be completed). In addition, up to seven bench scale and two additional pilot scale demonstrations are planned for the 1992 fiscal year.

Sediment for demonstration programs is obtained from five Areas of Concern within Canada: Toronto Harbour, Welland River, Hamilton Harbour, St. Marys River in Sault Ste. Marie and Thunder Bay Harbour.

Other sites are considered in special circumstances.

Information compiled from the technology reviews and demonstration series is communicated in several ways:

- Fact sheets summarizing the demonstrations are being distributed through Environment Canada's Communications Directorate, and abbreviated reports are also available upon request.
- The database is being distributed by the Wastewater Technology Centre for a small fee, which includes an update for the fiscal year in which the data base was purchased.
- Expressions of interest received by the Centre that were related to support services required for demonstrations/cleanups have been summarized in a "goods and services" list, which is available from the Centre on request.
- CoSTTeP personnel participate in and organize workshops in Canada and the United States on technology transfer issues.
- At the conclusion of CoSTTeP, a final report will be released rating the technologies demonstrated within the program.

To obtain further information on the Great Lakes Cleanup Fund or CoSTTeP, contact Griff Sherbin, Great Lakes Environment Office, Environment Canada, 25 St. Clair Avenue East, Sixth floor, Toronto, ON M4T 1M2, telephone (416)973-1107 or fax (416)973-7438, or Craig Wardlaw, Coordinator of CoSTTeP, Wastewater Technology Centre, P.O. Box 5068, 867 Lakeshore Road, Burlington, ON L7R 4L7, telephone (416)336-4691 or fax (416)336-8913.

BOOKSHELF

The following reports are available from the International Joint Commission's Great Lakes Regional Office, 100 Ouellette Avenue, Eighth floor, Windsor, ON N9A 6T3 or P.O. Box 32869, Detroit, MI 48232. For further information about this or other Commission reports, call (519)256-7821 in Canada, (313)226-2170 in the U.S. or fax (519)256-7791.

- *1991 Great Lakes Science Advisory Board Report, Revised*
- *Development of a Great Lakes - St. Lawrence Ecosystem Model Framework*

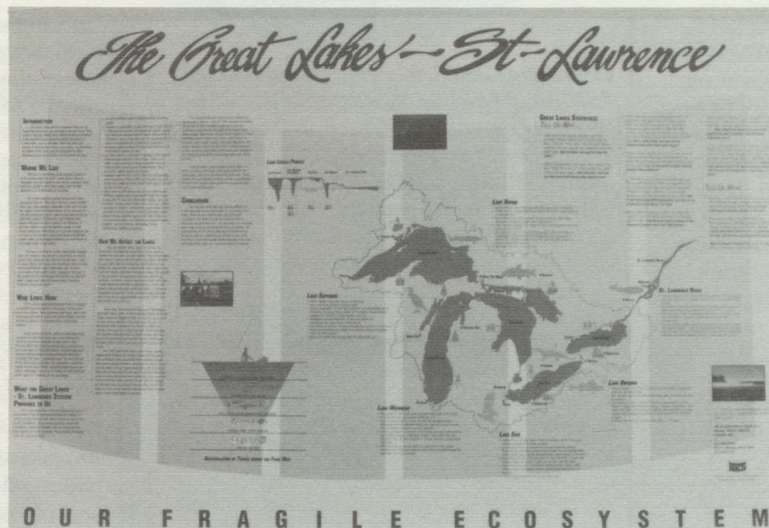
To obtain the following report contact the International Joint Commission office at 1250 23rd Street NW, Suite 100, Washington, DC 20440 (202)736-9000 or 100 Metcalfe Street, 18th floor, Ottawa, ON K1P 5M1 (613)995-2984.

- *Monitoring for Integrated Analysis. Final Report to the International Air Quality Advisory Board by the Expert Group on Monitoring*

Several new posters are available about the Great Lakes and water resources in general. *The Great Lakes-St. Lawrence - Our Fragile Ecosystem* is a 23" x 37" full-color poster showing historical and current information on the Great Lakes-St. Lawrence ecosystem. Statistical information prompts questions for student and teacher discussion. To receive a free poster in French or English contact the International Joint Commission's Regional Office (address and telephone numbers are located above).

The American Water Resources Association has produced a cartoon poster entitled *Water, the Resource that Gets Used and Used and Used for Everything*. Designed for elementary and middle school groups, the poster shows how water travels through the natural and human-made environment. To order a free poster, write to the American Water Resources Association, 5410 Grosvenor Lane, Suite 220, Bethesda, MD 20814. (301)493-8600.

The Great Lakes-
St. Lawrence -
Our Fragile
Ecosystem
is a new 23" x 37"
full-color poster
available from the
International Joint
Commission



Three posters featuring a robot-like *Groundwater Defender* are now available from Western Michigan University. The posters are primarily for the elementary school level and portray information about the water cycle, groundwater contamination and ways to protect the resource. For more information contact Western Michigan University, Groundwater Education in Michigan Regional Center, Kalamazoo, MI 49008-5150. (616)387-5505.

A second national report, *The State of Canada's Environment*, released in April, is the product of a collaborative effort of more than 100 experts from universities, private industry, environmental groups and government. The 27-chapter report outlines where Canadians have made progress toward sustainable development and identifies areas where work remains to be done.

The report is available for \$29.95 (Cdn) through bookstores or from the Canada Communication Group Publishing, Ottawa, Canada K1A 0S9. (819)956-4802.

Under an umbrella labeled Water Quality 2000, 86 organizations ranging from the Natural Resources Defense Council to the Chemical Manufacturers Association have reached a consensus on the major water quality problems facing the United States. Their conclusions have been

released in a report entitled, *Challenges for the Future*, the first step in an ongoing discussion among representatives of these diverse groups on improving water quality.

Copies of the report are available for \$20 (US) from Water Quality 2000, 601 Wythe Street, Alexandria, VA 22314-1994. (703)684-2418.

As part of the St. Lawrence Action Plan, the Canada Department of Fisheries and Oceans has published a series of ten **fact sheets**, each one dealing with a fish species threatened with extinction in the St. Lawrence River ecosystem. The documents were created based on a 1989 study and cover the Atlantic salmon, the northern pike and the striped bass. The fact sheets provide a description of the species, its reproductive habits, diet, current population statistics, how it is used by humans, the presumed causes of its decline and proposed corrective measures.

To receive the fact sheets in English or French, write to the Canada Department of Fisheries and Oceans, Quebec Region, Communications Branch, 901 Cap Diamant, C.P. 15-500, Québec, PQ G1K 7Y7.

Lewis Publishers, Inc., has produced a new catalog describing a range of publications in the environmental

sciences field. Areas covered are groundwater, hazardous materials, health, drinking water, wastewater, solid waste, ecology, toxicology, agriculture and atmosphere. A *Practical Guide to Managing Acidic Surface Waters and their Fisheries*, for example, explains how to manage acidic surface waters to preserve or restore fisheries and how to implement surface water management activities. The book can be ordered under catalog no. L755LARR for \$59.95 (US) or \$72 (Cdn) (plus shipping and handling).

To receive a free catalog of book listings contact Lewis Publishers, Inc., 2000 Corporate Boulevard NW, Boca Raton, FL 33431. (407)994-0555.

The most extensive **groundwater survey** ever conducted in Ontario is being undertaken by the University of Guelph and the University of Waterloo, in cooperation with the Ontario Soil and Crop Improvement Association. Samples from across the region are being tested for nitrates, bacteria and pesticides. The results of the regional study may provide insight into what farm practices need to be changed to implement a new groundwater protection plan.

To receive further information contact Leanne Coniglio, Waterloo Centre for Groundwater Research, University of Waterloo, Waterloo, ON N2L 3G1. (519)885-1211 ext 5003.

Among the factors that are expected to change with global climate warming are the extent and duration of ice cover on the Great Lakes in winter. The ice in turn has a profound effect on the climate of the area, modifying winter temperatures and precipitation patterns as well as affecting the economy through impacts on fruit crops, shipping, and recreation.

This information is located in the *Global Change Education Technology Fact Sheets*, produced by the School of Natural Resources and the Department of Educational Studies at the Ohio State University. For more information about global change education projects, contact Dr. Rosanne W. Fortner, Ohio State University School of Natural Resources, 2021 Coffey Road, Columbus, OH 43210. (614)292-2265, fax (614)292-7162.

The Royal Commission on the Future of the Toronto Waterfront has released its Final Report entitled *Regeneration: Toronto's Waterfront and the Sustainable City*. The book is available, free of charge, in French and English through all provincial bookstores or from the Royal Commission on the Future of the Waterfront, 207 Queen's Quay West, Suite 580, Toronto, ON M5J 1A7. (416)314-9490.

The Metropolitan Water Board, responsible for supplying portions of central New York with potable water, has released their 1991 *Lake Ontario Monitoring Program* report. A copy can be obtained from the Onondaga County Metropolitan Water Board, Alexander F. Jones Administration, 4170 Route 31, Clay, NY 13041. (315)652-8656.

A comprehensive look at the activities and accomplishments in the areas of Lake Erie and the Delaware Estuary are represented in a new booklet entitled *Pennsylvania Coastal Zone Management Program*. To receive a copy of the booklet or for more information about the coastal program contact Janis Dean, Department of Environmental Resources, Division of Coastal Zone Management, P.O. Box 8761, Harrisburg, PA 17105-8761. (717)541-7808.

Estimating Great Lakes Water Consumption: Analysis of Existing Models, published in cooperation with the University of Wisconsin-Madison Institute for Environmental Studies, probes estimates of Great Lakes water consumption. The analysis includes reports from the Great Lakes Commission, International Great Lakes Diversions and Consumptive Uses Study Board, the International Joint Commission and the Water Resources Council. The report states that estimated consumptive use is a small fraction of basin supply and that water quality implications have not been acknowledged.

Copies of the publication can be obtained for \$8 (US) from the University of Wisconsin Sea Grant Communications Office, 1800 University Avenue, Madison, WI 53705. (608)263-3259.

Several other publications are also available from the Sea Grant Communications Office. They include the *Solubility of Hydrophobic Aromatic Chemicals in Organic Solvent/Water Mixtures* (WIS-SG-92-940), *Volatile Carotenoid-Related Oxidation Compounds Contributing to Cooked Salmon Flavor* (WS-SG-92-941) and *Adenine Nucleotide Degradation in Modified Atmosphere Chill-stored Fresh Fish* (WIS-SG-92-942). Contact the above address for further information.

Ontario Conservation Authorities: Myth and Reality by Mitchell and Schrubsole is available for \$30.25 (Cdn) in library bookstores under Publication Series No. 35, ISBN 0-921083-41-6, or for more information, contact the Department of Geography, at the University of Waterloo, Waterloo, ON N2L 3G1. (519)885-1211 ext 3278.

A new series of 17 groundwater and public policy leaflets are available through the Groundwater Policy Education Project (GPEP). GPEP is a joint effort of the Cooperative Extension Service, the Freshwater Foundation, and the Soil and Water Conservation Society.

To increase citizens' and local and state officials' knowledge and assist them in making informed decisions, the organizations joined together to create

education materials. The new leaflet titles include: *Sources and Extent of Groundwater Contamination*, *Protecting Groundwater Quality by Managing Local Land Use*, *Communicating Water Quality Risk Issues to the Public*, and *Federal Policies and Programs to Protect Groundwater Quality*.

The leaflets may be purchased singly for \$2 (US) or as a package for \$15 (discounts available). To order contact the Freshwater Foundation, 725 County Road #6, Wayzata, MN 55391. (612)449-0092.

Environmentalism and Political Theory provides a detailed examination of the impact of environmentalism on contemporary political thought. A copy of the book can be ordered for \$14.95 paperback or \$44.50 hardcover (US) plus postage and handling from the State University of New York Press, c/o CUP Services, P.O. Box 6525, Ithaca, NY 14851. (607)277-2211, fax (800)688-2877.

A 1991 publication on *Global Environmental Change: Understanding the Human Dimensions* is available for \$29.95 (US) from the National Academy Press, 2101 Constitution Avenue, NW, Washington, DC 20418. (202)334-3313 or US only (800)624-6242.

Lines on the Land is an educational package to teach sixth through eighth grade students about conservation practices. The three-part package includes a 10-minute video, a 24-page brochure and 16 learning activities. The package can be ordered for \$26 (US) from the National Association of Conservation Districts, P.O. Box 855, League City, TX 77574 or in the U.S. call 1-800-825-5547.

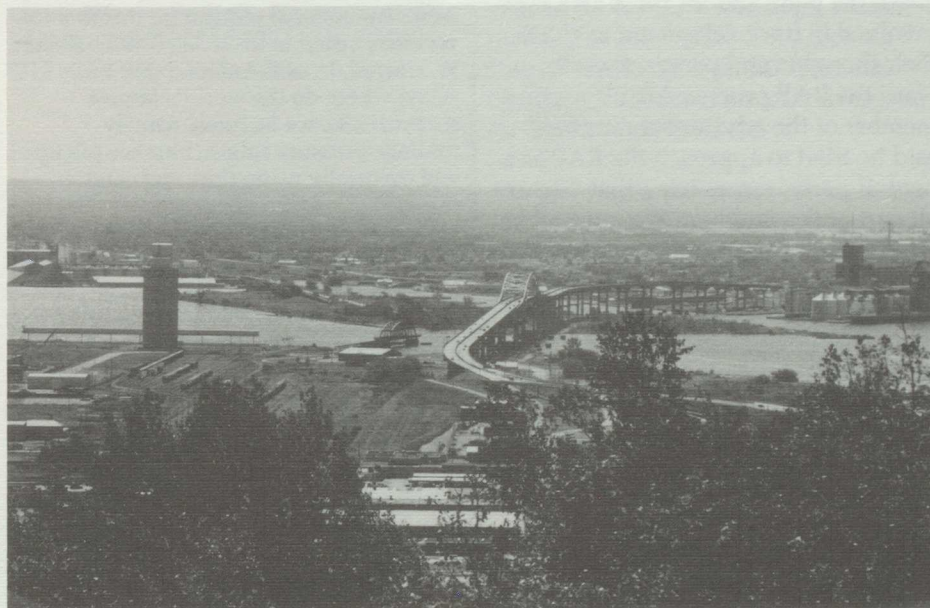
RAP UPDATES

GM Agreement Reached for Cornwall-Massena Area of Concern; Comments Sent for Maumee and Detroit River RAPs; Public Meeting Held to Celebrate Stage 1 RAP for St. Louis Area of Concern

In late May, General Motors agreed to spend \$78 million to remove contaminated sediments and soils from the **Massena** area of the St. Lawrence River and several tributaries, the neighboring St. Regis Indian Reservation and several areas on the foundry site. The foundry continues to produce aluminum cylinder heads for automobiles. However, past operations discharged several hazardous substances, including polychlorinated biphenyls, into four lagoons, two disposal areas and the landfill on the company's property. Sediments in the St. Lawrence River, local tributaries and soils on the reservation were contaminated by site runoff and wastewater discharges.

The first phase of cleanup to the Area of Concern and U.S. Superfund site is expected to take at least five years to complete.

The International Joint Commission, in a release dated April 27, 1992, stated that it is "quite encouraged" by the Stage 1 Remedial Action Plan for the **Maumee Area of Concern**. The plan presents a detailed overview of the environmental conditions and the types of activities that may contribute to the river's degradation. Additional analysis of the data to determine priorities for remediation and the effectiveness of any proposed cleanup activities would strengthen the plan in the Stage 2 phase. Thus, while there are gaps in the document, the Com-



St. Louis River Area of Concern, separating Duluth, Minnesota and Superior, Wisconsin.

mission concluded that work is underway to fill those gaps, and the basic problem definition is adequate to proceed with Stage 2 initiatives.

In early May, the Commission released its review comments for the **Detroit River RAP**. This was the first binational plan received by the Commission. As part of the working arrangement between Michigan and Ontario for binational Areas of Concern, Michigan's Department of Natural Resources has primary responsibility for development of the plan, with assistance from the Ontario Ministry of Environment. The Commission found that, while some use impairments were not fully addressed and additional information on loadings and nonpoint sources of pollution is also needed, the current condition in the area has been described, along with many sources of contaminants. The Commission also noted that the major problem of combined sewer overflows was only highlighted.

The Commission encouraged the RAP developers to incorporate the required additional information into the Stage 2 document, and to expand the involvement of additional interested publics in the development of the plan.

More than 75 residents of the Duluth, Minnesota and Superior, Wisconsin area joined with representatives of the International Joint Commission and state and local government agencies on May 14, 1992 to celebrate the completion of Stage 1 of the Remedial Action Plan for the **St. Louis River Area of Concern**.

The second largest tributary to Lake Superior, the St. Louis River takes on the characteristics of an estuary as it approaches the Duluth-Superior harbor. The Minnesota Pollution Control Agency and the Wisconsin Department of Natural Resources have joint responsibility for developing and implementing the RAP through each of its three stages.

The evening meeting provided the opportunity for citizens to learn more about the plan, and for those actively involved in its development to share their thoughts and perspectives toward the RAP process. John Powers, a member of the advisory committee, said he tried to approach the RAP as a neutral party, recognizing that "we are all part of the problem. We must all be part of the solution, and look for the common ground." Others, like Randy Marshall of North Star Steel, said he became and has stayed involved in the RAP process because he has enjoyed the river all of his life. More than 100 volunteers have participated in the RAP planning process as members of citizen and technical advisory committees since 1989.

The Commission's U.S. Chairman Gordon Durnil congratulated the citizens of the area for providing their time, expertise and support to the RAP process, and encouraged them to continue their exemplary work in the second and third stages. The Trinity Theatre group of Toronto, Ontario also performed skits about the history of the Lake Superior basin, how individual actions can affect the lake, and how citizens have interacted on the RAP public advisory committees.

For additional information on the St. Louis River RAP and its public participation program, contact Patricia Engelking, Minnesota Pollution Control Agency, 520 Lafayette Road, St. Paul, MN 55155, telephone (612)296-7442.

Letters to the Editor

Note: An unusual request for information was forwarded to us in April 1992. Robert W. Carroll, Jr. of Potsdam, New York asked where do the world's largest seasonal lake ice features, namely midlake pressure ridges, blue-ice pileups and especially wave-rime reefs and pseudokarst features, occur?

We directed Mr. Carroll to the Research and Engineering Lab in New Hampshire. However, this lab is primarily concerned with major engineering problems regarding ice. Could the Great Lakes possibly be the only place on Earth with the best examples of this phenomena? If any of our *Focus* readers can supply information on this subject, please contact us at the Regional Office in Windsor, or contact Mr. Carroll at 23 Pleasant Street, Apt 4, Potsdam, NY 13676.

Thank you for the subscription to *Focus* and the additional information you recently sent me. The material is not only current, but very impressively presented as well.

George Plantus
Windsor, Ontario

Thank you very much for sending me valuable information on the Great Lakes. I would like to express my sincere gratitude for your kind attention. These will be quite helpful to my ongoing works. I'm enclosing a book entitled, *Ocean Development: Present and Future*, which I wrote and edited. My continued subscription to your newsletter has assisted me greatly in the production of this book.

Sung-Hyun Kahng
Seoul, Korea

EVENTS

International Joint Commission Schedule of Meetings

The following includes meetings scheduled by the Commission and its various boards.
Please contact a Commission office for further information.

July	
19-24	Great Lakes Environmental Education Institute Brock University, St. Catharines, ON
August	
7-9	Physicians Roundtable, "Balancing the Scales: Mitigating the Health Effects of Great Lakes Pollution" Racine, Wisconsin
September	
14-15	Health Workshop, "Our Community, Our Health - A Dialogue Between Science and the Community" Ann Arbor, MI
15-17	Council of Great Lakes Research Managers Ann Arbor, MI
16-17	Commission Executive Session Washington, DC
16-17	Great Lakes Science Advisory Board Ann Arbor, MI
October	
15-16	Great Lakes Partner Events in conjunction with the World Congress for Education and Communication on Environment and Development Toronto, ON
16	Great Lakes Environmental Education Advisory Council Toronto, ON
20-22	Commission Semi-Annual Meeting Ottawa, ON

General Conferences

The **Ninth World Clean Air Congress** will be held at the Queen Elizabeth Hotel in Montréal, Québec from August 30 to September 4, 1992. The Congress will address critical issues in the global environment through the presentation of more than 400 papers by authors from 30 countries. Simultaneous translation in French and English will be provided at the opening, closing and technical sessions.

To receive further information, contact the Air & Waste Management Association, 3 Gateway Center, 4 West, Pittsburgh, PA 15222, fax (412)232-3450 or Air & Waste Management Association (Lock Box), P.O. Box 11149, Postal Section A, Toronto, ON M5W 2G5.

The **Water Environment Federation's 65th Annual Conference and Exposition** will be held in New Orleans, Louisiana on September 20-24, 1992. The conference will offer technical programs for water quality management growth.

To receive registration information write to the Water Environment Federation '92, c/o Galaxy, PO Box 3918, Frederick, MD 21701 or Water Environment Federation (formerly the Water Pollution Control Federation), 601 Wythe Street, Alexandria, VA 22314-1994.

On September 24-25, 1992, a conference entitled **The Science of Environmental Law** will be held at the Marriott Eaton Centre in Toronto, Ontario. The conference includes sessions on environmental science, site remediation and waste management options, groundwater, air pollution, wastewater technologies and risk assessment.

For registration information, contact Executive Enterprises, Inc., 22 West 21st Street, New York, NY 10010-6990, telephone (800)831-8333 in the U.S. or (212)645-7880 in Canada.

The **International Environmental Dredging Symposium** will be held in Buffalo, New York from September 30 to October 2, 1992. The symposium will highlight case studies from around the world, demonstrating environmental dredging as a remediation option for natural resource restoration. For more information contact the Erie County Environmental Education Institute, Inc., PO Box 56, Buffalo, NY 14205-0056. (716)858-6370.

The **Nineteenth Annual Aquatic Toxicity Workshop** will be held in Edmonton, Alberta on October 4-7, 1992. Topics will include anthropogenic discharges into northern aquatic environments, new toxicity testing methods, approaches and evaluation, and pathways and fate of contaminants in the aquatic environment.

To receive further information contact Earle Baddaloo, Program Chair, Alberta Environment, 5th floor, 9820-106 Street, Edmonton, AB T5K 2J6. (403)427-6102.

On October 7, 1992, a conference on **Lake Michigan: Utilizing Its Resources for Science Education** will be held aboard the S.S. Milwaukee Clipper. The focus of the conference is using Lake Michigan as a thematic approach in science education. Limited to 150 science educators, the meeting includes 16 concurrent sessions. Hands-on activities are encouraged, and all sessions must

pertain to Lake Michigan.

For more information on the conference or on future workshops aboard the ship contact Mike Kobe, School City of Hammond, Administration Center, 41 Williams Street, Hammond, IN 46320. (219)933-2400.

The **Fourteenth Canadian Waste Management Conference** to be held in Regina, Saskatchewan on October 7-9, 1992 will provide a forum for the exchange of social, scientific and technical viewpoints related to the management of solid and hazardous wastes.

To receive more information contact Susan Clarke, Technology Development Branch, Environment Canada, Unit 100, Asticou Centre, 241 Cité des Jeunes Blvd., Hull, PQ K1A 0H3. (819)953-5227, fax (819)953-9029.

A **World Congress for Education and Communication on Environment and Development** will be held in Toronto, Ontario, Canada on October 16-21, 1992. A series of **Partner Events**, including "The Great Lakes as a Freshwater Ecosystem," will take place in conjunction with the World Congress on October 15-16, 1992. Sponsors include the North American Association for Environmental Education, the Council of Outdoor Educators of Ontario, the United Nations Education, Scientific and Cultural Organization, the International Chamber of Commerce and the United Nations Environment Program.

To register for the **Freshwater Partners Event October 15-16**, contact Miriam Zweizig, The University of Michigan, School of Natural Resources, 430 East University, Dana Building, Ann Arbor, MI 48109-1115, (313)764-5171, fax (313)936-2195. To receive information or to register for

the **World Congress October 16-21**, contact ECO-ED, c/o Congress Canada, 191 Niagara Street, Toronto, ON M5V 1C9. (416)860-1772, fax (416)860-0380.

An International Conference on Environmental Water Chemistry will be held in Tianjin, China on November 4-6, 1992. The scope of the conference will include aspects of industrial, municipal, and agricultural pollution. Papers pertaining to surface waters, groundwaters and marine waters will be considered. For general information about the conference, contact Tianjin International Conference, Center for Science and Technology, 287 Heping Road, Tianjin 300041, P.R. China. telephone 0086-22-310038 or 316422, fax 0086-22-316423.

Setting the Global Example: A Chlorine-Free Great Lakes, a conference organized by Greenpeace, will be held December 4-6, 1992 in Monroe, Michigan at the St. Mary Center. This three-day conference will focus on the severity of the global organochlorine crisis and how to achieve the goal of a complete phase-out of the chlorine industry. Barry Commoner will provide the keynote speech. For additional information, contact Bonnie Rice, Greenpeace, 1017 W. Jackson, Chicago, IL 60607. (312)666-3305.

The Fifty-fourth Midwest Fish and Wildlife Conference will be held from December 6-9, 1992 at the Regal Constellation Hotel in Toronto, Ontario, Canada. Cosponsors include the Ontario Ministry of Natural Resources, Fisheries and Oceans Canada, the Canadian Wildlife Service and the

Ecosystem Integrity" is this year's conference theme.

For more information, contact the Ontario Ministry of Natural Resources, 90 Sheppard Avenue, Sixth floor, North York, ON M2N 3A1. (416)314-1059.

A Process Design Workshop on Industrial and Toxic Wastewater Management will be held on November 23-27, 1992 in Waterloo, Ontario. This practical applications-oriented workshop will cover process fundamentals, design and application, with hands-on experience in problem solving and demonstration of various state of the art technologies.

Please contact Evelyn James, Computational Hydraulics Inc., 36 Stuart Street, Guelph, ON N1E 4S5. (519)767-0197.

Focus
On International Joint
Commission Activities

IJC Great Lakes Regional Office
100 Ouellette Ave., 8th Floor
Windsor, Ontario N9A 6T3